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Tradable Permits for water management: Conceptual framework

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Structure of presentation

- Background and scope
- Typology of economic instruments in water management
 - Focus on the role of tradable permits (TPs)
- International experience with water pollution TPs (empirical cases) and lessons learned
- Application of TPs in water pollution
 - Strategies for introduction, opportunities and limitations, instrument mixes
- Conclusions


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Background and scope


- Move from *command-and-control* to *market instruments* to reduce water pollution
- Tradable discharge permits: a most challenging market instrument with limited experience
- Scope of presentation:
 - empirical basis + conceptual framework for the application of TPs in water pollution
 - specificity of water pollution (consideration of institutional issues, besides law and economics)
 - no in-depth analysis of the overall design and national implementation of TPs (see extensive OECD work)

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Typology

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Tradable permits (TPs): General

- Used for the allocation of shared resources among users
- Three different fields of application:
 - tradable water abstraction permits
 - tradable permits to water-borne resources
 - tradable water pollution permits (subject of this presentation)


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Tradable permits for water abstraction

- Often used for re-allocation of water rights
- Trading can be permanent, temporary (seasonal) or even one-off
- Application so far mainly in Chile, US & Australia (some experience in Spain, Mexico)
- Application mainly within the agricultural sector (but inter-sectoral transfers are promising)


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Tradable permits to water-based resources

- Applied to the use or consumption of water-borne resources, e.g. fish, energy of water
- Many interesting cases (e.g. case of salmon fisheries and exclusive fishing rights in Scotland)
- Trading may work, as long as there are no significant externalities (impacts on, or from, other water uses or functions)


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Tradable permits for water pollution

- Much higher degree of complexity than trading water abstraction rights
 - large number of pollutants with potential synergetic effects
 - precise location of discharges determines the environmental consequences
- Some practical experience in US, Australia
- EU provides "in theory" for trading in P and N emissions (Urban Waste Water Treatment Dir.); no use of this provision made so far


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International experience I

- Evaluation of 8 empirical cases from the US and Australia
- Three categories of trading according to polluting substances:
 - Salinity trading
 - Organic pollution trading
 - Nutrient pollution trading
- No detailed presentation of each case study, please refer to draft paper


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International experience II

| | | |
|----------|-------------------------|---|
| Salinity | Murray-Darling (AUS) | 1 parameter, end-of-valley salinity target (at 1 point), rights exchanged between States |
| | Hunter River (AUS) | 1 parameter, 1 salinity target (at 2 points), real-time data/continuous monitoring |
| Organic | Fox River (US) | Few participants, trade unattractive due to low gains |
| Nutrient | Hawkesbury-Nepean (AUS) | Bubble of 3 point sources, strong regulatory framework |
| | Tar-Pamlico (US) | Basin-bubble for 14 point sources, transactions with non-point through a non-point source fund |
| | Lake Dillon (US) | Phosphorus bubble for the lake, trade non-point – point at a ratio 2:1, co-operative management |
| | Cherry Creek (US) | Phosphorus standard and TDML for the reservoir, trade of non-point – point allowed |
| | Chesapeake Bay (US) | Cap for Bay, Nutrient Trading Negotiation Team agreed guidelines for States, voluntary basis |


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Lessons learned I

- Experience with trading should be considered in the context and pre-existing conditions (US, AUS had prior functional regulation)
- Trading effectively applied for single chemical or physical parameters (nutrients, P or N, are traded as single substances)


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Lessons learned II

- Salinity: continuous analysis possible, easy to monitor market participants
- Organic pollution (Fox River): lack of understanding of abatement and its costs
- Nutrient pollution:
 - success with bubbles over point sources
 - strong pre-existing regulation as a framework
 - growing interest in trade between point and non-point (but uncertainty in estimation and monitoring of non-point, complex array of issues)


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Strategies for introducing TPs I

- Value of an existing functioning system (command-and-control or other market-based) for pollution control prior to trade
 - trading benefits from pre-existing monitoring and enforcement
- Value of a pilot phase to explore and test all scheme elements


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Strategies for introducing TPs II

- Shift from technology pollution controls to controls on emission
- Ensure effective control on quantity and quality of effluents
- Define tradable rights
- Establish a cap
- Establish a mechanism for the allocation of tradable rights


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Strategies for introducing TPs III

- Involve sufficient number of potential buyers and sellers
- Give room to "fine-tune" the allocation and trading rules / periodic evaluation to be able to respond to new challenges
- But avoid too frequent revision of rules that jeopardise investments made
- Clarify "ground rules" between trading and regulatory limits


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Some factors favouring trading

- Assurance and acceptance of trading rights and rules (legal establishment or other stable framework)
- Monitoring and reliable data
- Thorough pilot phase/consultation
- Good scientific understanding of the pollution factors and the catchment
- Obvious market advantage from trading


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Some factors impeding trading

- Ineffective administration and long approval process
- Uncertain legal viability of rights
- Creation of pollution hot spots due to trade
- Trading only in restricted geographical zones (e.g. sub-river basins), which may lead to a "small market"


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Compatibility of TPs with other instruments

- Taxes and charges
 - may encourage to sell "sleeping" water rights
 - mutually reinforcing with tradable permits
- Environmental quality objectives (EQOs)
 - equivalent to "bubbles"
 - may be prerequisite to tradable permits
- Technology-derived standards (BAT)
 - limited compatibility with tradable permits


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Compatibility of TPs with other instruments

- **Principles of environmental policy**
 - TPs compatible with polluter-pays, resource-user-pays, prevention principle
 - weak compatibility with pollution-reduction-at source
- **Overall compatibility in instrument mixes**
 - TPs compatible with most existing instruments and can be part of an instrument mix
 - *but* TPs are more demanding in terms of enforcement and monitoring than other instruments


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Conclusions I

- **Legal framework secures trading scheme but should be linked to practical realities of the country/region (existing infrastructure and context)**
- **Well-designed monitoring and enforcement should be in place**
- **So far, few markets for water pollution, still experimental**


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Conclusions II

- **Functioning schemes built on traditional environmental management systems and strong (pre-existing) regulatory regimes**
- **Examples from the US and Australia**
 - advanced economies with pre-existing regulation for pollution control, monitoring, enforcement
 - federal countries providing flexibility for innovative instruments in individual States
- **Pilot phase in certain regions prior to nation-wide application is advisable**

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Selection of relevant studies

Kraemer, R.A., Pielen, B. and A. Leipprand 2003: "Global Review of Economic Instruments for Water Management in Latin America", Working Paper for the Inter-American Development Bank Regional Policy Dialogue, Environment Network, Meeting II: Application of economic instruments in water and solid waste management, 25-26.2.2003, Washington D.C.


Kraemer, R. Andreas; Eduard Interwies and Eleftheria Kampa 2002: "Tradable Permits in Resource Protection and Management: A Review of Experience and Lessons Learned," in: OECD (ed.): *Implementing Domestic Tradable Permits - Recent Developments and Future Challenges*, 227-265. Paris: OECD.

Kraemer, R.A. and K.M. Banholzer 1999: "Tradeable Permits in Water Resource Management and Water Pollution Control," in: OECD Proceedings, *Implementing Domestic Tradeable Permits for Environmental Protection*, Paris: OECD.

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Thank you for listening.

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